

We Claim:

1. A method of performing distributed traffic engineering comprising:

creating a network of nodes coupled to a central management module, wherein the central management module and the network of nodes are located in a single chassis;

distributing traffic engineering functions between the central management module and at least one of the nodes; and

sending a feedback regarding an offending source from the at least one of the nodes to the central management module or another one of the nodes.

2. The method of claim 1, wherein the network of nodes comprise at least one smart node having one or more traffic engineering functions and at least one non-smart node.

3. The method of claim 2, wherein the traffic engineering for the non-smart node is provided by the central management module.

4. The method of claim 1, wherein the traffic engineering comprises egress traffic shaping.

5. The method of claim 4, wherein the egress traffic shaping comprises rate policing.

6. The method of claim 1, wherein the traffic engineering comprises performing differentiated services.

7. The method of claim 1, wherein the traffic engineering comprises providing an end-to-end Quality of Service (QoS).

8. The method of claim 1, further comprising detecting the offending source by the at least one of the nodes.

9. The method of claim 1, wherein providing the feedback
5 comprises piggybacking the feedback on a data packet.

10. The method of claim 1, wherein providing the feedback comprises creating an artificial packet containing the feedback.

10 11. The method of claim 1, wherein the at least one of the nodes and the another one of the nodes are smart nodes having capabilities to perform one or more of the traffic engineering functions.

15 12. The method of claim 1, wherein the at least one of the nodes comprises a network processor subsystem.

13. The method of claim 1, wherein the at least one of the nodes is capable of at least one of restricting traffic and
20 finding another path through a switching fabric.

14. The method of claim 1, further comprising performing one or more of traffic metering, policing, packet marking and rate limiting at a port of the at least one of the nodes.

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15. The method of claim 6, wherein performing the differentiated services comprises defining per hop behavior of at least one of queuing, scheduling, policing and flow control.

30 16. A packet switching system for performing distributed traffic engineering, comprising:

at least one network processor subsystem;

at least one switching engine coupled to the at least one network processor subsystem;

a switching fabric coupled to the at least one switching engine; and

5 a central management module coupled to the switching fabric for managing the system,

wherein traffic engineering functions are distributed between the central management module and the at least one network processor subsystem, and

10 wherein the at least one network processor subsystem provides a feedback regarding an offending source to another network processor subsystem or the central management module.

17. The packet switching system of claim 16, wherein the
15 feedback is piggybacked on a data packet.

18. The packet switching system of claim 16, further comprising a chassis, wherein the at least one network processor subsystem, the switching engine, the switching fabric and the
20 central management module are installed in the chassis.

19. A packet switching system for performing distributed traffic engineering, comprising:

a network of nodes; and

25 a switching fabric coupled to the network of nodes,

wherein traffic engineering functions are distributed between at least two of the nodes, and

wherein at least one of the at least two of the nodes sends a feedback to another one of the network of nodes.

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20. The packet switching system of claim 19, further comprising a central management module coupled to the switching

fabric, wherein the traffic engineering functions are distributed between the central management module and the at least two of the nodes.

5 21. The packet switching system of claim 20, wherein the network of nodes comprises at least one non-smart node, and wherein the feedback for the non-smart node is processed by the central management module.

10 22. The packet switching system of claim 19, wherein the distributed traffic engineering comprises providing an end-to-end Quality of Service (QoS).

15 23. The packet switching system of claim 19, wherein the distributed traffic engineering comprises providing differentiated services.

20 24. The packet switching system of claim 19, wherein at least one of the at least two of the nodes detects an offending source.

25 25. The packet switching system of claim 19, wherein at least one of the network of the nodes is capable of at least one of restricting traffic and finding another path through the switching fabric.

30 26. The packet switching system of claim 19, wherein at least one of the nodes includes a port that can perform at least one of traffic metering, policing, packet marking and rate limiting.

27. The packet switching system of claim 19, wherein the system performs differentiated services, including defining per hop behavior of at least one of queuing, scheduling, policing and flow control.

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28. The packet switching system of claim 19, wherein a response to the feedback is user programmable.